

**REMARKS/ARGUMENTS**

Claims 23-28 are newly added. Claims 5-7, 12, 15, 18, and 19 are canceled.

Specifically, claims 5-7 and 12 are respectively cancelled and redrafted as new independent claims 23, 25, 27, and 28, each of which explicitly incorporates the limitations of the previously submitted claim 1, from which each of claims 5-7 and 12 depended. Claims 18 and 19 are accordingly cancelled and redrafted as new claims 24 and 26 for proper dependency. Claims 1, 20, and 22 are amended for better format. In addition, claim 1 is amended to recite that "Ra >90." Support for the amendment can be found at, e.g., paragraph 0058 of the present application as published. No new matter is added. Entry of the above amendments is respectfully requested. Claim 4 was cancelled in a previously submitted Amendment. Upon entry of the above amendments, claims 1-3, 8-11, 13-14, 16-17, and 20-28 are pending. Reconsideration of the present application is respectfully solicited in view of the above amendments and the following remarks.

It is gratefully noted that in the October 27, 2009 Office Action the Examiner allowed claim 21 and indicated that claim 22 would be allowable if rewritten in a proper format. As shown in the above-presented amendments, claim 21 remains unchanged, and claim 22 has been amended so that it properly depends from claim 21. Therefore, claims 20-21 are allowable.

**I. Anticipation Rejections under 35 U.S.C. 102(e)**

Claims 1-3, 9-11, 13 and 15 have been rejected under 35 U.S.C. §102(e) as being anticipated by Mueller (USP 6,717,353). Reconsideration and withdrawal of this rejection are respectfully requested.

First, claim 1 has now been amended to recite that Ra is greater than 90. Nowhere does Mueller disclose that Ra is greater than 90. For example, as shown at col. 4, the third table of Mueller, when SrS<sub>5</sub>N<sub>8</sub>:Eu is used together with Sr-SiON, each of the Ra values listed therein is below 90. It is noted that the maximum Ra values listed at col. 4, the first table of Mueller is 90, which is not greater than 90. Moreover, the Ra values listed at col. 4, the first table of Mueller are only achieved by using SrS (see the paragraph immediately before that table), not by using the first and second phosphors as recited in claim 1 of the present application. Therefore, for at least this reason, claim 1 and its dependent claims are not anticipated by Mueller under 35 U.S.C. § 102(e).

Second, Applicants believe that the reasons presented in the previously submitted Amendment are still valid. Specifically, independent claim 1 recites a white-emitting LED, which comprises, among other things, two phosphors. The first phosphor is from the class of the oxynitridosilicates having a cation M and the empirical formula M<sub>(1-c)</sub>Si<sub>2</sub>O<sub>2</sub>N<sub>z</sub>:D<sub>c</sub>, where M comprises Sr as the main constituent and D is doped with divalent Europium, M = Sr or M = Sr<sub>1-x-y</sub>Ba<sub>y</sub>Ca<sub>x</sub> with 0 < x+y < 0.5 being used. The second phosphor is a nitridosilicate of formula (Ca,Sr)<sub>2</sub>Si<sub>5</sub>N<sub>8</sub>:Eu.

The Examiner points to col. 2, lines 16-42 of Mueller as disclosing the first phosphor of present claim 1. For reasons expressed below, Mueller fails to disclose anywhere, including col. 2, lines 16-42, the first phosphor recited in claim 1 of the present application.

At col. 2, lines 16-21, Mueller discloses a luminescent material having the formula (Sr<sub>1-a</sub>-<sub>b</sub>Ca<sub>b</sub>Ba<sub>c</sub>)Si<sub>x</sub>N<sub>y</sub>O<sub>z</sub>:Eu<sub>a</sub> (a=0.002-0.2, b=0.0-0.25, c=0.0-0.25, x=1.5-2.5, y=1.5-2.5, z=1.5-2.5). This formula is apparently different from the formula of the first phosphor of claim 1 of the present application. For example, 1) Mueller fails to disclose that each of x, y, and z (i.e., the

relative amount of Si, O, and N) in its formula must be 2 at the same time to read on the amount of Si, O, and N as recited in claim 1 of the present application for the first phosphor; 2) nor does Mueller disclose that the total relative amount of the Eu and Sr (or Sr, Ba, and Ca) must be 1 to read the amount of M and Eu as recited in claim 1 of the present application for the first phosphor. Therefore, Mueller fails to disclose at col. 2, lines 16-21 thereof the first phosphor as defined in claim 1 of the present application. Moreover, nowhere else does Mueller disclose the first phosphor as defined in claim 1 of the present application.

The Examiner cites col. 3, lines 42-51 of Mueller to demonstrate that Mueller discloses the second phosphor of claim 1 of the present application. For reasons expressed below, Mueller fails to disclose anywhere, including col. 3, lines 42-51, the second phosphor as defined in claim 1 of the present application.

At col. 3, lines 42-51, Mueller discloses several examples of phosphors, such as  $(Sr_{1-a-b-c}Ba_bCa_c)_2Si_5N_8:Eu_a$  ( $a=0.002-0.2$ ,  $b=0.0-1.0$ ,  $c=0.0-1.0$ );  $(Ca_{1-x-a}Sr_x)S:Eu_a$  ( $a=0.0005 \dots 0.01$ ,  $x=0.0-1.0$ );  $Ca_{1-a}SiN_2:Eu_a$  ( $a=0.002-0.2$ ) and  $(B_{1-x-a}Ca_x)Si_7N_{10}:Eu_a$  ( $a=0.002-0.2$ ,  $x=0.0-0.25$ ). Except for the first formula  $(Sr_{1-a-b-c}Ba_bCa_c)_2Si_5N_8:Eu_a$  ( $a=0.002-0.2$ ,  $b=0.0-1.0$ ,  $c=0.0-1.0$ ), each of the other formulae listed at col. 3, lines 42-51 of Mueller is apparently different from the second phosphor  $(Ca,Sr)_2Si_5N_8:Eu$  as defined in claim 1 of the present application.

As to the first formula  $(Sr_{1-a-b-c}Ba_bCa_c)_2Si_5N_8:Eu_a$  ( $a=0.002-0.2$ ,  $b=0.0-1.0$ ,  $c=0.0-1.0$ ) of Mueller, it fails to disclose that the relative total amount of Ca and Sr must be 2, as defined in claim 1 of the present application for the second phosphor of the present application.

In the outstanding October 27, 2009 Office Action, the Examiner does not specifically address Applicants' previously presented arguments, as reiterated above. The Examiner indicates at pages 8-9, the bridging paragraph, that Mueller teaches the relative amount of Si

being 2 in the first phosphor of claim 1 of the present application, because Mueller discloses that the relative amount of Si is between 1.5 and 2.5. The Examiner apparently misunderstands the relationship between broad range and narrow range, genus and species, concerning the issue of anticipation. The law is clear that a species can anticipate a genus, and a narrow range can anticipate a broad range entirely encompassing the narrow range, but not the reverse. *See, e.g., Atofina v. Great Lakes Chem. Corp.*, 441 F.3d 991, 999, 78 USPQ2d 1417, 1423 (Fed. Cir. 2006) (wherein the court held that a reference temperature range of 100-500 degrees C did not describe the claimed range of 330-450 degrees C with sufficient specificity to be anticipatory.)

The Examiner also indicates at pages 8-9, the bridging paragraph, of the Office Action that Muller teaches the dopants of Sr and Ca in the second phosphor of claim 1 of the present application, because Mueller discloses the use of Sr with Ce and/or Ba. However, Sr together with Ce and/or Ba are not the same as Sr and Ca.

For reasons expressed above, Mueller fails to disclose every element of claim 1 of the present application. Therefore, claim 1 of the present application is not anticipated by Mueller under 35 U.S.C. 102(e). For at least the same reasons, claim 3, 9-11, 13 and 15, each of which depends from claim 1, are also not anticipated by Mueller under 35 U.S.C. 102(c). Withdrawal of the anticipation rejection is, therefore, respectfully requested.

## **II. Obviousness Rejections under 35 U.S.C. 103(a)**

### **A. Rejection of claims 5-7, 12, 18 and 19 under 35 U.S.C. §103(a) as being unpatentable over Mueller, in view of Delsing**

Claims 5-7, 12, 18 and 19 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Mueller, in view of Delsing (US2005/0205845).

As stated above, claims 5-7 and 12 have been rewritten in independent form respectively as new claims 23, 25, 27, and 28. Claims 18-19 have also been rewritten as new dependent claims 24 and 26 for proper dependency.

Delsing is a U.S. national phase application of an International Application filed September 23, 2003, which is only one day earlier than the German priority application date of the present application. A verified English translation of our German priority application is submitted herewith to perfect Applicants' priority claim.

As shown in Applicants' Declaration under Rule 131 and exhibits thereto, which are submitted concurrently herewith, Applicants have an invention date that is earlier than the international filing date of Delsing (i.e., September 23, 2003). Applicants have therefore properly disqualified Delsing as a prior art under 35 U.S.C. § 102(e) through the Declaration under Rule 131.

Accordingly, the rejection of claims 5-7, 12, 18 and 19 under 35 U.S.C. §103(a) as being unpatentable over Mueller in view of Delsing has now become moot. Withdrawal of this rejection is respectfully requested.

### **B. Rejection of claims 8, 16 and 17 under 35 U.S.C. §103(a) as being unpatentable over Mueller in view of Bischoff.**

Claims 8, 16 and 17 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Mueller in view of Bischoff (USP 6,158,882).

This obviousness rejection relies on Mueller as the primary reference in combination with Bischoff as the secondary reference. Bischoff is cited to demonstrate that certain additional features recited in dependent claims have been known in the art. Bischoff cannot remedy the deficiencies discussed above in connection with claim 1. Therefore, a combination of the primary reference Mueller with Bischoff would not lead to the invention recited in any claim that depends from independent claim 1, including claims 8, 16, and 17. Withdrawal of this obviousness rejection is, therefore, respectfully requested.

**C. Rejection of claim 14 under 35 U.S.C. §103(a) as being unpatentable over Mueller in view of Ellens (USP 2002/0105269).**

Claim 14 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Mueller in view of Ellens (USP 2002/0105269).

This rejection relies on Mueller as the primary reference in combination with Ellens as the secondary reference. Ellens is cited to demonstrate that certain additional features recited in dependent claim 4 have been known in the art. Ellens cannot remedy the deficiencies discussed above in connection with claim 1. Therefore, a combination of the primary reference Mueller with Ellens would not lead to the invention recited in any claim that depends from independent claim 1, including claim 14. Withdrawal of this obviousness rejection is, therefore, respectfully requested.

**CONCLUSION**

The Commissioner is hereby authorized to charge our Patent and Trademark Office Deposit Account No. 03-2412 the amount of \$660.00 in payment of the government fee for three new independent claims (\$220 each) in excess of three (3). Any additional fees or charges required at this time in connection with the present application may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Based on the foregoing, it is believed that the present application has been placed in condition for allowance. Early and favorable consideration is respectfully requested.

Respectfully submitted,  
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